

frequency control words are stored in the memory of microcomputer 37 rather than in separate frequency control registers as was discussed in connection with figure 4. The microcomputer 37 causes the crystal oscillator 1 to sequence through a series of modes of oscillation using control line 30 to squelch each oscillation before a new mode is initiated. Control line 28 is used in connection with switch 8 to remove the injection signal after oscillations have been established. The frequency of the VCXO 33 is compared with the frequency of the mode controlled crystal oscillator 1 during each mode of the latter. The frequencies of two of the modes compared to the VCXO frequency can be combined to obtain a measure of the ambient temperature since the temperature coefficients of the modes in the crystal oscillator 1 are all different. Information on the temperature characteristics of one of the modes can be prestored in the microcomputer memory and this, combined with the measure of the temperature, used to determine the actual frequency to the VCXO 33 at that temperature. A correction value for VCXO is then calculated by the microcomputer 37 and applied to the digital to analog converter 34 by way of control lines 38. The VCXO 33 then being kept on the desired frequency, is used as the output signal 39 from the temperature compensated crystal oscillator.

It should be noted that by utilizing a plurality of modes in crystal oscillator 1 it is possible to compensate for more than temperature, i.e. hysteresis effects, aging, etc. This is described in patent 6,545,550.